

**Notice of Allowability**

Application No.

09/987,941

Examiner

Erica E Cadugan

Applicant(s)

DAHL ET AL.

Art Unit

3722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the request for reconsideration filed April 2004.
2. ☒ The allowed claim(s) is/are 1-4.
3. ☐ The drawings filed on \_\_\_\_\_ are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☒ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_\_.

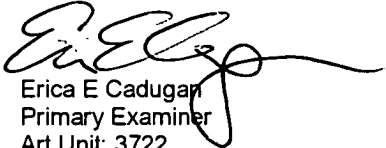
Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying Indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 4/20/2004
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

  
Erica E Cadugan  
Primary Examiner  
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***Reasons for Allowance***

1. The following is an examiner's statement of reasons for allowance:

It has been well-established in the machining arts that cutting conditions, such as cutting speed and cutting depth, for example, are dependent upon a number of factors such as what type of machining operation is being performed (turning vs. milling, for example), what material is being machined (i.e., different conditions are required to mill a soft material such as aluminum than for a hard tool steel, for example), the material of the cutter, and whether the machining is a "dry", i.e., uncooled, unlubricated, operation or a "wet", i.e., cooled/lubricated, operation. Machining guides or handbooks such as Machinery's Handbook, 25<sup>th</sup> ed., provide such teachings (see the cited pages therefrom).

That being said, U.S. Pat. No. 4,961,757 (Rhodes et al.), U.S. Pat. No. 5,655,860 (Oles), and the cited article "Opportunities for Advanced Ceramics to Meet the Needs of the Industries of the Future" are representative of the closest prior art of record to the invention as set forth in the present independent claims 1 and 3.

Re Rhodes et al., Rhodes et al. was discussed in detail in the preceding office action. Rhodes et al. teaches the general machining conditions set forth in the claims with the exception of the material being milled. Rhodes et al. teaches these milling conditions being used in the milling of gray cast iron as described in the preceding office action.

Rhodes does not teach the use of these milling conditions to mill a workpiece comprising aluminum and cast iron as set forth in independent claim 1. Additionally, there is no combinable teaching in the prior art of record that would reasonably motivate one having ordinary skill in the art to use the milling conditions taught by Rhodes to mill a workpiece comprising aluminum and

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cast iron as set forth in independent claim 1, and thus, Rhodes neither anticipates nor renders obvious independent claim 1.

Regarding independent claim 3, Examiner previously took the position that gray cast iron, since it contains graphite flakes as a “predominant microstructural feature”, can be considered a “composite material” as set forth in independent claim 3. However, Applicant’s arguments on pages 1-3 of the request for reconsideration filed April 20, 2004 with respect to this position are persuasive. It is particularly noted that the “microstructural” graphite flakes or the “lamellar graphite carbon-rich phase in a matrix of pearlite” of the gray cast iron are not teachings of two materials that are “distinct” in that the graphite and carbon or steel do not differ in form or composition on a “macro scale”, which conclusion results when considering the definition of the term “composite material” in the context of material science and/or metallurgy as described by Applicant.

Thus, Rhodes does not teach the use of the described milling conditions to mill a “composite material” as set forth in independent claim 3. Additionally, there is no combinable teaching in the prior art of record that would reasonably motivate one having ordinary skill in the art to use the milling conditions taught by Rhodes to mill a workpiece comprising aluminum and cast iron as set forth in independent claim 3, and thus, Rhodes neither anticipates nor renders obvious independent claim 3.

Re Oles, Oles was discussed in detail in the preceding office action. Oles teaches the general machining conditions set forth in independent claim 1, except Oles teaches that the silicon nitride inserts are used in the wiper position, and thus does not explicitly teach that the silicon nitride inserts are used to accomplish “at least the majority of material removal”.

Examiner previously took the position that since Oles does not preclude the use of silicon nitride inserts in the primary milling position, so long as other material inserts are used in the wiper position (i.e., so long as the wiper inserts are made of a material different than the primary milling inserts, it does not appear to matter to the machining operation of Oles), it would have been obvious to have substituted whatever known cutting insert materials were desired or expedient, such as silicon nitride and some other material, to an end user for the primary milling and wiper inserts.

However, that position is withdrawn, since it appears to be based on impermissible hindsight since the invention as claimed would not necessarily result by such a modification. As previously noted above, desirable milling conditions (such as the desired cutting speed and depth) vary based on many factors including the selection of the material used for the milling cutter. Thus, even assuming arguendo that it would have been obvious to make the materials of the primary and wiper inserts out of whatever known cutting insert material (including making the primary inserts out of silicon nitride) was desired or expedient to an end user, it is unknown whether the claimed cutting conditions of the “cutting speed of 1000-3000 m/min” and the “cutting depth of 0.2-2mm” would result, since it is not taught by Oles, nor other combinable references, what cutting speeds and depths would be necessary if the cutting material was changed as asserted by the Examiner.

This argument also applies to independent claim 3.

Additionally, there is no combinable teaching in the prior art of record that would reasonably motivate one having ordinary skill in the art to so modify the teachings of Oles, and

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thus, for at least this reasoning, Oles does not render obvious the present invention as set forth in independent claims 1 and 3.

It is also noted that the cited article "Opportunities for Advanced Ceramics to Meet the Needs of the Industries of the Future" teaches some specific machining conditions for cutting a workpiece in a turning operation with a silicon nitride cutter (page 2-5, lines 5-16), specifically teaches that silicon nitride cutting inserts can be used in the milling of gray cast iron (page 2-5, lines 19-23), and also specifically teaches that silicon nitride is being evaluated for tooling for aluminum processing (page 2-6, first full paragraph). However, it is noted that this article does not provide any specific machining conditions (i.e., cutting speed, depth, etc.) for a milling operation at all, nor particularly for a milling operation of either a "composite material" or a material comprising "aluminum and cast iron", and thus does not serve to either singularly or in combination remedy the deficiencies of the Rhodes and Oles references.

Additionally, there is no combinable teaching in the prior art of record that would motivate one having ordinary skill in the art to so modify the teachings of the described cited article and thus, for at least this reasoning, said article does not render obvious the present invention as set forth in the independent claims.

As a side note with respect to claim 1, it is further noted that the Machinery's Handbook, 25<sup>th</sup> ed., explicitly teaches away from using a ceramic cutting tool (and silicon nitride is a ceramic) to machine aluminum or aluminum alloys (see page 973, for example).

Thus, for at least the foregoing reasoning, the prior art of record neither anticipates nor renders obvious the present invention as set forth in the independent claims.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Priority***

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Sweden on November 22, 2000. It is noted, however, that applicant has not filed a certified copy of the Swedish application as required by 35 U.S.C. 119(b).

### ***Conclusion***

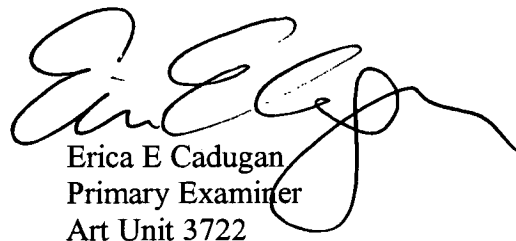
3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erica E Cadugan whose telephone number is (703) 308-6395. The examiner can normally be reached on M-F, 7:30 a.m. to 5:00 p.m., alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrea L. Wellington can be reached on (703) 308-2159. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Erica E Cadugan  
Primary Examiner  
Art Unit 3722

eec  
May 27, 2004